

## Letter To The Editor

# A family intoxicated by daffodil bulbs mistaken for onions

Dear Editor,

Daffodil (*Narcissus* spp.), a common spring-flowering perennial, contains a toxic chemical that can cause gastrointestinal symptoms if ingested. In Japan, daffodil leaves may be mistakenly placed in dumplings or stir fry instead of Chinese chives when cooking.<sup>1</sup> Also, accidental use of daffodil bulbs instead of onions is a known mistake and has been previously reported in the literature.<sup>2</sup> According to data from the Japanese Ministry of Health, Labour, and Welfare, 195 cases of accidental daffodil poisonings were reported between 2009 and 2019 in Japan, and one of the victims died. Therefore, clinicians should be aware of this pathology and become familiar with typical clinical manifestations and treatment. The most abundant bioactive alkaloids characterized in daffodil extracts are lycorine and galantamine. These compounds are thought to induce vomiting by irritating the gastric mucosa and stimulating the chemoreceptor trigger zone in the medulla oblongata. Lycorine is found in all segments of the plant, with the highest concentration in the bulbs.<sup>3</sup> These alkaloids likely pose significant risk not only during bulb planting, but also during storage and disposal of dead plants.

A family, comprising a 27-year-old man (son), a 65-year-old man (father), and a 59-year-old woman (mother), presented at their local emergency department complaining of sudden onset nausea and vomiting. They were hemodynamically stable and alert with negative medical histories. Their abdomens were soft without tenderness or fever. We interviewed the patients to collect information regarding consumption of toxic substances. The family reported that the father cooked curry and served it for lunch. They felt the taste of onions was a little bitter and spat it out immediately. They presented with nausea and abdominal pain approximately 30–60 min after lunch, followed by vomiting of food and yellow fluid several times. After fluid infusion was given with supplementation of 10 mg metoclopramide, their symptoms gradually disappeared within a few hours. An emergency physician called the local Public Health Center and an investigation revealed that the father had chopped up daffodil bulbs grown in their garden instead of onions. Liquid chromatography–mass spectrometry of the leftover curry sauce and the bulbs revealed 5.5 µg/g and 3,100 µg/g lycorine, respectively. We found the incident was a cluster of daffodil intoxication.

In humans, daffodil ingestion causes rapid onset of gastrointestinal symptoms including vomiting, nausea, diarrhea, and acute abdominal pain that may endure for several hours.

An animal study demonstrated correlations between nausea score and lycorine dose as well as between number of induced emetic events and dose.<sup>4</sup> Since there are no specific antidotes or neutralizers for daffodil poisonings, most patients are conservatively treated for gastrointestinal symptoms or dehydration. Among antiemetics, only ondansetron may reduce the degree of lycorine-induced nausea and prolong the time to onset of vomiting, indicating that histaminergic, muscarinic and dopaminergic receptors are presumably not involved in lycorine-induced emetic effects.<sup>3</sup> Administration of activated charcoal is contraindicated in vomiting patients.

Poisoning after consumption of plants or other forms of plant exposure in Japan are rare. We emphasize that accurately identifying the consumed plant and collecting details on the nature of the exposure can be critical in investigating the likely risks. Daffodil poisonings can be effectively medically managed by sharing our experience outlined in this letter.

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## DISCLOSURE




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## REFERENCES

- 1 Matulkova P, Gobin M, Evans M, Parkyn PC, Palmer C, Oliver I. Gastro-intestinal poisoning due to consumption of

- daffodils mistaken for vegetables at commercial markets, Bristol, United Kingdom. *Clin. Toxicol. (Phila)* 2012; 50: 788–90.
- 2 Litovitz TL, Fahey BA. Please don't eat the daffodils. *N. Engl. J. Med.* 1982; 306: 547.
- 3 Kretzing S, Abraham G, Seiwert B, Ungemach FR, Krugel U, Regenthal R. Dose-dependent emetic effects of the Amaryllidaceous alkaloid lycorine in beagle dogs. *Toxicol* 2011; 57: 117–24.
- 4 Kretzing S, Abraham G, Seiwert B *et al.* In vivo assessment of antiemetic drugs and mechanism of lycorine-induced nausea and emesis. *Arch. Toxicol.* 2011; 85: 1565–73.